

NSF-AFOSR Joint Workshop on Future Ultra-High Temperature Materials

Dr. Bill Fahrenholtz (PI) and Dr. Greg Hilmas (co-PI)
Department of Ceramic Engineering, University of Missouri-Rolla
DMR 0403004

Ultra-high temperature materials (UHTMs) are a family of compounds that are stable at high temperatures (e.g., above 2400°C) and in reactive atmospheres (e.g., monatomic oxygen). An improved scientific understanding of UHTMs would enable revolutionary advancements in hypersonic flight, atmospheric re-entry, and rocket propulsion.

Purpose

The workshop brought together people from academia, industry, and government labs from the U.S. and abroad to identify the basic research needs related to UHTMs



Main engine for space shuttle orbiter



NASA concept vehicle for hypersonic flight

Outcomes

- Established a UHTM working group
- Identified current unmet needs
New materials, structure-property relationships
- Discussed promising experimental approaches
Synthesis, processing, and characterization
- Developed a UHTM website
<http://www.umsr.edu/~uhtm>